

SN54F245, SN74F245 OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS

SDFS010A – MARCH 1987 – REVISED OCTOBER 1993

- 3-State Outputs Drive Bus Lines Directly
- Package Options Include Plastic Small-Outline (SOIC) and Shrink Small-Outline (SSOP) Packages, Ceramic Chip Carriers, and Plastic and Ceramic DIPs

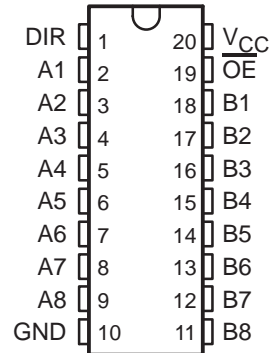
description

These octal bus transceivers are designed for asynchronous communication between data buses. The devices transmit data from the A bus to the B bus or from the B bus to the A bus depending upon the logic level at the direction-control (DIR) input. The output enable (\overline{OE}) input can be used to disable the device so the buses are effectively isolated.

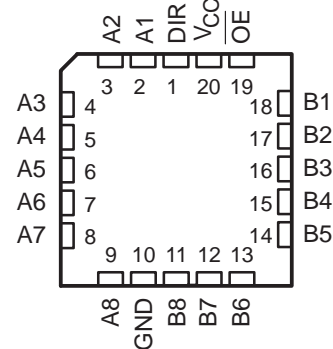
The SN74F245 is available in TI's shrink small-outline package (DB), which provides the same I/O pin count and functionality of standard small-outline packages in less than half the printed-circuit-board area.

The SN54F245 is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74F245 is characterized for operation from 0°C to 70°C .

SN54F245 . . . J PACKAGE
SN74F245 . . . DB, DW, OR N PACKAGE
(TOP VIEW)



SN54F245 . . . FK PACKAGE
(TOP VIEW)



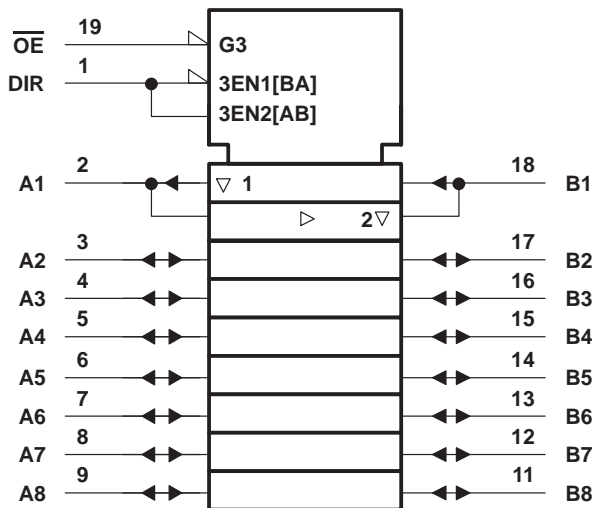
FUNCTION TABLE

INPUTS		OPERATION
\overline{OE}	DIR	
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation

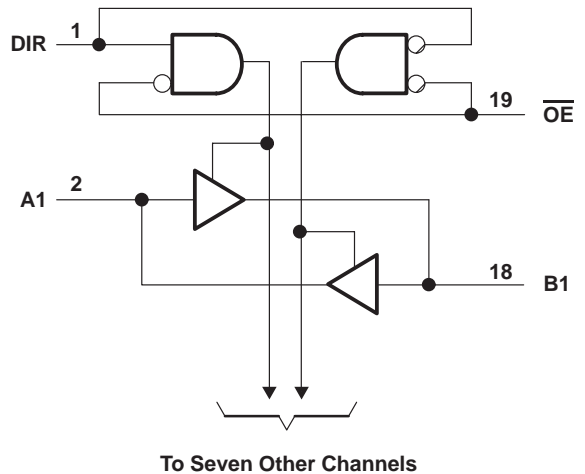
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logic symbol†



logic diagram (positive logic)



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)‡

Supply voltage range, V_{CC}	-0.5 V to 7 V
Input voltage range, V_I (except I/O ports) (see Note 1)	-1.2 V to 7 V
Input current range	-30 mA to 5 mA
Voltage range applied to any output in the disabled or power-off state	-0.5 V to 5.5 V
Voltage range applied to any output in the high state	-0.5 V to V_{CC}
Current into any output in the low state: SN54F245 (A1 thru A8)	40 mA
SN54F245 (B1 thru B8)	96 mA
SN74F245 (A1 thru A8)	48 mA
SN74F245 (B1 thru B8)	128 mA
Operating free-air temperature range: SN54F245	-55°C to 125°C
SN74F245	0°C to 70°C
Storage temperature range	-65°C to 150°C

‡ Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE 1: The input voltage ratings may be exceeded provided the input current ratings are observed.

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recommended operating conditions

		SN54F245			SN74F245			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.8			0.8	V
I_{IK}	Input clamp current			-18			-18	mA
I_{OH}	High-level output current	A1 thru A8		-3			-3	mA
		B1 thru B8		-12			-15	
I_{OL}	Low-level output current	A1 thru A8		20			24	mA
		B1 thru B8		48			64	
T_A	Operating free-air temperature	-55		125	0		70	°C

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER		TEST CONDITIONS		SN54F245		SN74F245		UNIT	
				MIN	TYP†	MAX	MIN		TYP†
V_{IK}		$V_{CC} = 4.5\text{ V}$,	$I_I = -18\text{ mA}$			-1.2		-1.2	V
V_{OH}	A1 thru A8	$V_{CC} = 4.5\text{ V}$	$I_{OH} = -1\text{ mA}$	2.5	3.4	2.5	3.4	V	
			$I_{OH} = -3\text{ mA}$	2.4	3.3	2.4	3.3		
	B1 thru B8	$V_{CC} = 4.5\text{ V}$	$I_{OH} = -12\text{ mA}$	2	3.2				
			$I_{OH} = -15\text{ mA}$			2	3.1		
Any output		$V_{CC} = 4.75\text{ V}$,	$I_{OH} = -1\text{ mA to } -3\text{ mA}$				2.7		
V_{OL}	A1 thru A8	$V_{CC} = 4.5\text{ V}$	$I_{OL} = 20\text{ mA}$		0.3	0.5		V	
			$I_{OL} = 24\text{ mA}$				0.35		0.5
	B1 thru B8	$V_{CC} = 4.5\text{ V}$	$I_{OL} = 48\text{ mA}$		0.38	0.55			
			$I_{OL} = 64\text{ mA}$				0.42		0.55
I_I	A and B	$V_{CC} = 5.5\text{ V}$	$V_I = 5.5\text{ V}$			1		1	mA
	DIR, \overline{OE}		$V_I = 7\text{ V}$			0.1		0.1	
I_{IH}^\ddagger	A and B	$V_{CC} = 5.5\text{ V}$,	$V_I = 2.7\text{ V}$			70		70	μA
	DIR, \overline{OE}					20		20	
I_{IL}^\ddagger	A and B	$V_{CC} = 5.5\text{ V}$,	$V_I = 0.5\text{ V}$			-0.65		-0.65	mA
	DIR, \overline{OE}					-1.2		-1.2	
I_{OS}^\S	A1 thru A8	$V_{CC} = 5.5\text{ V}$,	$V_O = 0$	-60	-150	-60	-150	mA	
	B1 thru B8			-100	-225	-100	-225		
I_{CC}	$V_{CC} = 5.5\text{ V}$		Outputs high	70	90	70	90	mA	
			Outputs low	95	120	95	120		
			Outputs disabled	85	110	85	110		

† All typical values are at $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$.

‡ For I/O ports, the parameters I_{IH} and I_{IL} include the off-state output current.

§ Not more than one output should be shorted at a time, and the duration of the short circuit should not exceed one second.

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switching characteristics (see Note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC} = 5 V, C _L = 50 pF, R _L = 500 Ω, T _A = 25°C			V _{CC} = 4.5 V to 5.5 V, C _L = 50 pF, R _L = 500 Ω, T _A = MIN to MAX†				UNIT
			'F245			SN54F245		SN74F245		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{PLH}	A or B	B or A	1.7	3.8	6	1.2	7.5	1.7	7	ns
t _{PHL}			1.7	4.2	6	1.2	7.5	1.7	7	
t _{PZH}	$\overline{\text{OE}}$	A or B	2.2	4.9	7	1.7	9	2.2	8	ns
t _{PZL}			2.7	5.6	8	2.2	10	2.7	9	
t _{PHZ}	$\overline{\text{OE}}$	A or B	2.2	4.6	6.5	1.7	9	2.2	7.5	ns
t _{PLZ}			1.2	4.6	6.5	1.2	10	1.2	7.5	

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

NOTE 2: Load circuits and waveforms are shown in Section 1.

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